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Title: Atalanta Program Computer Science Overview

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Los Alamos NATIONAL LABORATORY

Atalanta Program
Computer Science Overview

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Replace and add LA-UR number

Overview: Computer Science

- What is Computer Science?
- Related fields: Computer Science vs Computer Engineering
- Types of jobs held by folks with certain degrees (BS, MS, PhD)

What is Computer Science?

- Example
  - A calculator in python
  - Example of simple command line calculator
  - Example of graphical scientific calculator

- Questions
  - Can i calculate the sum of 2 numbers?
  - Can I balance my checkbook?
  - Can I calculate the various distances between the planets?
  - Can I run this on my iphone??

What is Computer Science?

Study of algorithmic processes, computational machines and computation

- Software engineering
  - who is the audience for the code? (School Teacher? Accountant? Physicist?)
  - how will they be using the code? (command line? Graphic interface?)
- Analysis of algorithms
  - how long is it taking for my code to run?
  - can i improve the efficiency of my code?
- Operating system principles
  - will my code need to run on a specific architecture? (MacOS, Windows, Linux)
  - how will several codes run on a system at the same time?
- Computer architecture
  - which architecture will run my code most efficiently?
  - will my code need to run across several systems at the same time?

What is Computer Engineering?

Study that integrates electronic engineering with computer science

- Computer architecture
  - How do i measure efficiency of a system
  - Can I design a better motherboard (faster memory access?)
- Electrical engineering
  - Can I improve the design of a system to make it more efficient? (less power usage)
  - Can i make circuits on a motherboard smaller?
- Network engineering
  - Can i design a fast network device to allow hundreds of systems to connect quickly
- Embedded systems
  - How lightweight can i make a device with full functionality (mobile phones? hearing aids?)
  - Computers in appliances

Degrees

- Bachelors - 4 years
  - Application development, System administration, Network management, User interface design, Web development
- Masters - 6 years
  - Similar jobs but with more specialization towards improving and designing processes and environments in each area, more overall understanding of various subjects
- PhD - 8+
  - Teaching at University level
  - Research into future technologies and developments

Activity

- LANL History of Computing
  - https://hpchistory.lanl.gov/#vars!panel=10848213!
- Timeline of women in computing
  - https://int.lanl.gov/employees/diversity/resource-groups/women-computing/index.shtml

Questions?